## Chapter 6

## Minerals

FROM THE POINT of view of its industrial development, Kerala's mineral resources are a weak link in the State's economy. With a share of only 1.7 per cent in the all-India production of the minerals, Kerala lags behind most other States in the output of minerals. During 1955-56, the net value contributed by the minerals (Rs. 1.95 crores) was 0.6 per cent of the State income against one per cent of country's income.

6.2 The important minerals of the State are beach sands comprising ilmenite, monazite, rutile, sillimanite, zircon, china-clay and tile-clay. Among these ilmenite and china-clay are the most prominent. The reserves of these minerals are adequate to last more than 20 years and may, therefore, be classified as "minerals with adequate reserves". Graphite, iron ore and mica are also found, though only in very small quantities. The deposits of limeshells occur in lakes and along the coast, but are rather modest in content. The metallic minerals and fossil fuels, however, are almost completely absent. It is the deficiency of these minerals which presents an obstacle to the growth of large scale industries.

6.3 Apart from beach sand collection and limeshell winning from the lakes and estuaries, there are eleven workings, all open cast. These do not include tile-clay working about which no data is available. The number of persons engaged in all these 11 mining enterprises (inclusive of beneficiation) is roughly 6,900. However, according to 1951 Census, the number of persons employed in mining as well as in stone-quarrying is about 18,000, i.e., 0.3 per cent of total working force (all-India 0.4%).

6.4 Table 28 gives the output of minerals from the various workings and their value. In 1955, the value of minerals production was Rs. 1.35 crores. Next year, the value of production went upto Rs. 1.95 crores, representing an increase of approximately 37 per cent. This steep rise was mainly due to the increase in ilmenite production, which went upto 314,348 tons in 1956 from 231,585 tons in 1955. Production registered a further increase of about Rs. 20 lakhs during the next year, (that is, 1957), reaching a level of Rs. 2.1 crores. This was maintained during the next two years, that is, 1958 and 1959. In 1960, however, there was a setback as one of the mineral sand companies had since closed down; and it is likely that the value of the output might not have exceeded Rs. 1.3 crores.

[Text continues on p. 92]



[Table 28 appearing on p. 289 of the text, has not been processed -- Analyst]

investment for this will be about Rs. 5 lakhs and additional employment for 350 persons.

*Graphite*

6.40 This mineral occurs in the form of disseminated grains, stringers and thin veins in surface laterites and the crystalline rocks underneath, mainly charnockitic and associated types. While the disseminated grains occur in charnockitic rocks, the worthwhile occurrences appear to be confined to the area of leptynites.[1]

6.41 Surface occurrences of graphite are known to occur in Kerala at a number of places, viz., Plachikuzhi, Nellimood, Narical, Ozhupara, Karipur, Perumpallimuzhi and Vellanad in Nedumangad taluk, Puliyarakonam and Chenagalloor in Neyyattinkara taluk and in various other isolated localities in Trivandrum district. The occurrences are being investigated geo-physically using electrical methods without appreciable success. This is probably due to the electrical anomalies being marked by the laterite host rock. Perhaps geo-chemical methods may prove more fruitful.

6.42 This mineral was mined in Kerala between 1898 and 1911 by the Morgan Crucible Company, altogether 35,000 tons of material being won. Consequent upon the discovery of graphite in Madagascar, operations ceased in Kerala. The most productive mine was at Vellanad. Recently operations were started at Aukulam on a small scale, but were suspended shortly thereafter. The production has been negligible. The prime need in the near future will be to have a more detailed prospecting on the lines suggested.

*Iron Ore*

6.43 Quartz-magnetite bodies are reported from various localities. In all these cases, the top of these bodies is laterized and often very rich in iron. However, within a few feet the iron content decreases very appreciably.

6.44 The Nanminda occurrence (Pookunnu Hill) is probably the largest one. It would be necessary to explore this area in detail, possibly with core drills before any reasonable conclusion can be drawn. The ore body is steep dipping and will have to be won by underground mining, and further, magnetite concentrate obtained. All this would make the prospect very dear when compared to other iron ore occurrences elsewhere in the country being currently exploited. Further, the possibility of establishing a pig iron plant based either on low-shaft furnaces or electrical furnace techniques, is fraught with difficulties because of the non-availability of coke or lignite and fluxing material within the State.

*Limeshell Deposits*

6.45 Even though no important horizon of limestone is found in the State, limeshell is found to occur in the various backwaters and also in the estuaries of some

[1] T.C. Chacko: *A Sketch of the Geology of Travancore.*

11: India G-4, 5 (1960-1961) 1962 AW11 Kerala AW11



6.53 First, possibilities of an alternative source, e.g., shells from the sea, should be assessed quantitatively, which could possibly meet requirements of the local lime-burning units. This would relieve the pressure on the lake and estuarine deposits, which could then be conserved for larger industrial units.

6.54 Secondly, new industries could perhaps be located near other known shell deposits. A case in point here is the Calcium Carbide Factory requiring about 10,000 tons annually, which could be located in the Kadalundi area where reserves of the order of 400,000 to 500,000 tons are available. In this location the unit would be assured of its shell requirements for the next 40 to 50 years on the basis of an average annual requirement of 10,000 tons, whereas in the Vembanad lake location, reserves would last only for 15 to 20 years.

6.55 The requirements of the sand-lime brick factory, however, are only about 3,500 tons a year and it should be possible to accommodate this requirement from the present consumption of 25,000 tons by the lime-burning industry.

6.66 In this context, it would be relevant to mention that in absolute terms, the accretion of shells is rather small; and in terms of the proposed rate of exploitation this accretion is even negligible. Further, the proposal to construct a bar across the mouth of the Vembanad lake would change the salinity of the water and would very likely put an end even to this small accretion. As to whether the shell organism could be simulated to thrive on a large scale is a problem for long term research.

6.57 In the meantime, in view of the rapid depletion of reserves in the Vembanad lake, strict control should be exercised over the exploitation of this deposit with periodical inspection to check unauthorized collection. The rate of exploitation may be kept at the present level but should not be allowed to rise.

*Mica*

6.58 Two varieties of mica, muscovite and phlogopite are known to occur in the State. Muscovite is reported from Kulikhoor, and Sholayaramson from Palghat district and phlogopite from Punalur in Quilon district. However data relating to reserves are not available for any of these deposits.

6.59 At Kulikoor in Palghat district, a few prospecting pits have been put down which exposed a small vein of ruby mica with very little strains. The presence of ruby mica on a fairly large scale along the same belt in the adjoining State may be taken as a favourable indication. Further prospecting should be undertaken in the area.

6.60 Production from the only mine in the State at Punalur has been intermittent. Figures for production since 1957 when mining activity was revived are given below:

| Year | Quantity (Metric tons) | Value (Rs.) |
|---|---|---|
| 1957 | 72 | 40,000 |
| 1958 | 72 | 40,000 |
| 1959 | 46 | 23,000 |

11: India G-4,5 (1960-1961) 1962 AWII Kerala AWII



6.61 Formerly mica used to be exported from this mine, but now because of its inferior grade and development of cheaper substitutes, the market has ceased to exist. Production has been giving demand and the mine is again on the verge of closing down.

*Quartz-Sand*

6.62 An extensive deposit of quartz-sand occurs along the Shertallai-Pattanakad-Pallipuram-Panavally area. Reserves of the order of 80 million tons are said to exist here. However, all the sand is not glass grade, being gritty in large portions.

6.63 There are two workings in Shertallai taluk, one at Pallipuram and the other at Panavally. Mining is selective in that only such areas which contain finer material are worked. The workings are not mechanized. The raw sand is sieved and winnowed at the workings. Further sieving is done at the glass factory, the final recovery standing at 50 per cent of the original, and represents the portion between 30 and 80 mesh screens.

6.64 About 3,000 tons sand is produced annually with a pits-mouth-value of Rs. 1.50 a ton. A major portion of the output is consumed by the glass factory at Alwaye, while the rest is supplied to silicate factories in the State and consumers outside the State.

6.65 A sand-lime brick factory is coming up at Pallathara in the public sector with an installed capacity of 44,000 bricks a day and it will be a major consumer of quartz-sand. Its sand requirements would be 33,750 tons a year. The total raw sand requirements by 1965-66 would be 46,000 tons a year. Exploitation at this rate would require an investment of Rs. 2 lakhs. By 1970-71, the sand requirements would further increase to 90,000 tons a year requiring an additional investment of Rs. 15 lakhs. At the same time, an integrated scheme to work the sands systematically and utilize both the coarse and finer grades should be undertaken, rather than leaving the sand collection to contractors.

*Salt*

6.66 Salt, besides being an essential ingredient of food, also serves as a basic raw material for the manufacture of alkalies. It is commonly extracted from sea water by solar evaporation. Production of salt in Kerala during the last few years has been as follows :

| Year | Quantity (Metric tons) | Value (Rs.) |
|---|---|---|
| 1955 | 56,094 | 1,180,000 |
| 1956 | 783 | 10,000 |
| 1957 | 536 | 5,000 |
| 1958 | 708 | 10,000 |
| 1959 | 1,007 | 13,000 |

11: India G-4, 5 (1960-1961) 1962 AWII Kerala AWII



*433 316 formation of a large number of companies which together won 600 ozs. of metal. During the last war, operations were again commenced but mainly for pyrite, which were also given up.

6.76 It is obvious that all surface occurrences have been worked out. However, prospecting for hidden lodes could still be carried out. A preliminary survey by panning up the stream to the heads of the tributaries in search of mother lodes is indicated.

135 6.77 *Lignite*: A lignite occurrence two feet to eight feet thick exposed on the beach at Varkalai had been reported, but it has proved to be abortive on drilling.

6.78 *Semi-Precious Stones*: The presence of semi-precious stones like cats' eye, amethyst, and iolite are reported from various places in Nedumangad taluk, Thiruvalla and Kollengode, but none has proved worthwhile. Recently beryl has also been reported from mica bearing area at Kulikkoor in Palghat district.

6.79 *Kankar*: In the black cotton soil tracts of Kozhinjampara and Chittur firkas in Palghat district kankar limestone is met with and is used locally in lime burning.

6.80 *Gypsum* : It is known to occur in similar soils in the Coimbatore district of Madras State. An intensive search may, therefore, be made in these black cotton soil areas for this mineral.

## CONCLUSIONS

*433 135 6.81 Mineral resources play a vital role in the economic development of any region. The process of industrial development generally involves a shift from industries based on primary raw materials like agricultural or forest produce to more technologically advanced industries using a higher content of metallic minerals. Kerala is unfortunately placed in this respect as its mineral resources are marked by absence of any of these basic minerals, namely, coal, iron and copper.

*433 317 6.82 Some of Kerala's industries, however, do have good prospects. Beach sands, the chief mineral assets of Kerala, are the source of titanium bearing ilmenite. Although possibilities of increase in export of this sand are not bright, internal demand for ilmenite from the Titanium Dioxide industry is expected to rise substantially. Similarly, extensive deposits of quartz sand and fine quality china-clay occur in the State. This report envisages a considerable expansion in demand for both of these from existing industries as well as from new factories suggested for production of high tension insulators, sand-lime bricks, etc. In contrast to these three, the other minerals have only limited potentials of development. Thus monazite which contains the radioactive element thorium is available in quantity but has a restricted demand at present. On the other hand, the known reserves of limeshell are in short supply and do not offer scope for expansion of the cement industry based on it.

[135] 6.83 Among the rest, iron ores are not capable of being developed for lack of coal while mica and graphite would depend entirely on future discoveries.

6.84 On the whole, an increase in mineral production from a value of Rs. 130 lakhs in 1961 to Rs. 197 lakhs by 1965-66 and Rs. 250 lakhs by 1970-71 is envisaged here. Between 1956 and 1961 there was, however, a fall in the value of output from